Name: Date:

Polynomial Factoring solution (version 638)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 19 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(19)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 76}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-40}}{2}$$

$$x = \frac{6 \pm \sqrt{-4 \cdot 10}}{2}$$

$$x = \frac{6 \pm 2\sqrt{10}\, i}{2}$$

$$x = 3 \pm \sqrt{10}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 - 2i$ and $7 - 9i$ in standard form $(a + bi)$.**

Solution

$$(3 - 2i) \cdot (7 - 9i)$$

$$21 - 27i - 14i + 18i^2$$

$$21 - 27i - 14i - 18$$

$$21 - 18 - 27i - 14i$$

$$3 - 41i$$

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3. **Write function $f(x) = x^3 - x^2 - 24x - 36$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	-1	-24	-36
-3		-3	12	36
	1	-4	-12	0

$$f(x) = (x + 3)(x^2 - 4x - 12)$$

$$f(x) = (x + 3)(x + 2)(x - 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 6)^2 \cdot (x + 3)^2 \cdot (x - 2)$$

Sketch a graph of polynomial $y = p(x)$.